

REMARKS

Applicants thank the Examiner for the thorough examination of the application. No new matter is believed to be added to the application by this Amendment.

Entry Of Amendment

Entry of this Amendment under 37 C.F.R. §1.116 is respectfully requested because it places the application in condition for allowance. Also, this Amendment complies with matters of form set forth in the Office Action. Alternately, entry is requested because the amended claims reduce issues for appeal.

Status Of The Claims

Claims 1, 4, 5 and 8-10 are pending in the above-identified application. Claim 9 has been amended to stand as an independent claim. The limitations amended into claim 9 were also previously presented in claims 3 and 4 (now cancelled), and no new issues are thus being presented for the Examiner's consideration. Amendments to the claims are presented that address clarity issues. It is submitted that all of the presently pending claims find full support in the original disclosure of the present application.

Rejection Under 35 U.S.C. §112, First Paragraph

Claims 4 and 8-10 are rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement. Applicants traverse.

At pages 2-4 of the Office Action, the Examiner asserts that the following limitation in claim 4 is not enabled: "said sheet has a complex elastic modulus $E\alpha$ in the extrusion direction and a complex elastic modulus $E\beta$ in a 90° direction from the extrusion direction, ***such that if said rubber composition is made into 2 mm sheets with a roller***, said moduli fulfill the following equation . . ." (Emphasis added). The Examiner equates this limitation with the process of forming a tire tread with a roller, which is mutually exclusive with the extruding the rubber composition into a tube shape, such as is set forth in claim 4.

However, the limitation of "if said rubber composition is made into 2 mm sheets with a roller" pertains to the measurement method of measuring elastic modulus. Page 19, lines 1-11 of the specification first mentions a ***measurement*** sample having 1.0 mm in thickness, 4 mm in width and 5 mm in length, then making tread rubber into a 2 mm sheet with a roller. It is clear that the elastic modulus of this 2 mm sheet is being measured.

As a result, the claims are fully enabled by the specification so that one of ordinary skill can practice the invention without undue experimentation. This rejection is overcome and withdrawal thereof is respectfully requested.

Rejection Under 35 U.S.C. §112, Second Paragraph

Claims 1, 4, 5, and 8-10 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Applicants traverse.

At page 4 of the Office Action, the Examiner asserts that the preamble of claim 1 recites a tread while the body of the claim pertains to a rubber sheet. However, there is no requirement to delineate each and every non-critical component of the invention. *In re Mayhew*, 527 F.2d 1229, 11233, 188 USPQ 356, 358 (CCPA 1976).

Also, claim 5, has been amended in accordance with the Examiner's suggestion.

Further, claim 1 has been amended to alternately recite "plate material or short fiber" so as to remove the grounds for rejection and objection to claims 9 and 10.

As a result, the claims are clear, definite and have full antecedent basis. This rejection is overcome and withdrawal thereof is respectfully requested.

Rejections Under 35 U.S.C. §103(a)

Claims 5 and 8-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over JP '718 (Japanese Patent Application 2001-138718) in view of JP '034 (Japanese Patent Application 60-219034). Claims 1, 4, 5 and 8-10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Goettler (USP 4,056,591) in view of Tajima (USP 5,429,487), JP '718 and JP '034. Applicants traverse.

Present Invention and Its Advantages

The present invention is directed to a process for preparing a studless tire having excellent performance on ice and snow due to friction caused by a scratching effect by short fibers on the tread surface.

As set forth in claim 1 of the present invention, the tire tread is formed from a rubber composition containing 2 to 50 parts of short fiber or plate oriented in the circumferential direction, and a cutting from the tube shaped rubber composition has a complex elastic modulus E_a in the extrusion direction and a complex elastic modulus E_b normal to the extrusion direction such that $1.1 \leq E_b/E_a$.

Claim 9 of the present invention pertains to a studless tire having a tread obtained by a process that includes (1) cutting a rubber sheet perpendicularly to the extrusion direction, (2) rotating each cut piece by 90° and (3) laminating the rotated pieces together.

The process and product of the present invention provide for advantageous properties as evidenced by the comparative test results summarized in the present specification. Note, for example, that Comparative Example 8 exhibits inferior ice performance properties and abrasion resistance properties when compared to Examples 3-5 as shown in Table 2 of page 26 of the specification. Despite the fact that Comparative Example 8 was formed using the tube perform process of the present invention, because the complex elastic modulus properties fail to satisfy those of the present invention, the advantageous properties exhibited by Examples 3-5 (present

invention) cannot be attained. This provides objective evidence supporting the fact that the process of the present invention produces a tire exhibiting advantageous properties related to the complex elastic modulus recited in the present claims.

A second source of evidence supporting the patentability of the claims of the present application is evident from a review of Comparative Example 5 in Table 2, where a conventional extrusion method was used, rather than the tube preform process of the present invention. Comparative Example 5 exhibits inferior ice performance and abrasion resistance properties when compared to Examples 3-5 (present invention) which employ the tube preform process of the present invention.

Distinctions over Cited References

JP '718 pertains to a pneumatic tire that has short fibers oriented substantially vertically to the tread surface (Abstract). However, JP '718 pertains to a summer tire that is utterly different from the studless tire of the present invention. Furthermore, JP '034 describes a tire technology that is neither studless nor describes short fibers.

Goettler pertains to a rubber sheet. However, a tire is only one example of the many uses of the rubber sheet of Goettler (see Goettler at column 7, lines 58-63). Goettler fails to disclose or suggest a studless tire. Although Goettler enumerates fibers at column 3, lines 43-51, it is clear that soft fibers having no scratching effect can be used.

That is, all of Goettler, JP '718 and JP '034 fail to disclose a studless tire.

Also, the cited references fail to disclose or suggest the modulus relationship of claim 1 ($1.1 \leq E_b/E_a$) or claims 4 and 9 ($60 \leq (E_1 - E_\beta)/(E_\alpha - E_\beta) \times 100 \leq 100$). However, the Examiner fails to acknowledge the novelty of these modulus relationships. Typically, the Examiner states in the Office Action at page 8, lines 13-15: "The claimed complex elastic modulus properties are descriptive of the fibers being orientated in one direction. Each of the applied references teaches this subject matter." However, the Examiner fails to point out where in the references the teaching or suggestion to produce these mathematical modulus relationships can be found.

Further, the Examiner fails to note that the present invention gives specific fiber dimensions for the fiber or plate material in the claims. In contrast Goettler '591 uses cellulose fiber (Column 8, line 41; column 11, line 9) and fails to give the dimensions of the cellulose fiber.

Regarding claim 9, claim 9 of the present invention pertains to a studless tire having a tread obtained by a process that includes (1) cutting a rubber sheet perpendicularly to the extrusion direction, (2) rotating each cut piece by 90° and (3) laminating the rotated pieces together. The studless tire shows an excellent performance on ice and snow due to the scratching effect of short fibers on the tread surface. In the present specification, the complex modulus E_1 of Example 1 is a high value of 7.2 MPa (see Table 1), and it is clear that the orientation direction of the short fibers in the tread of example 1 is in the tread thickness direction. Consequently, the orientation of short fibers can bring about an excellent scratching effect.

In contrast, Goettler only pertains to extruding a fiber-loaded rubber material into a sheet. Tajima merely pertains to an extruder for making sheet elastomers. JP '718 merely pertains to a summer tire. JP '034 fails to disclose a studless tire or short fibers. As a result, one having ordinary skill in the art would not be motivated by the cited art references produce a studless tire having the elastic modulus relationships set forth in independent claims 1 and 9. A *prima facie* case of obviousness has thus not been made. Claims depending upon claims 1 and 9 are patentable for at least the above reasons.

These rejections are overcome and withdrawal thereof is respectfully requested.

Information Disclosure Statements

The Examiner is thanked for considering the Information Disclosure Statement filed June 27, 2003 and January 19, 2005 and for making the initialed PTO-1449 forms of record in the application in the Office Action mailed March 15, 2005.

Foreign Priority

The is thanked for acknowledging foreign priority and that certified copies of the priority documents have been received in the Office Action mailed March 15, 2005.

The Drawings

The Examiner is respectfully requested to indicate whether the drawing figures are acceptable in the next official action.

Conclusion

It is submitted for the reasons stated above that the present claims define patentable subject matter such that this application should now be placed condition for allowance.

If any questions arise regarding the above matters, please contact Applicant's representative, Robert E. Goozner (Reg. No. 42,593), in the Washington Metropolitan Area at the phone number listed below.

Applicant believes no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 02-2448, under Order No. 1403-0252P from which the undersigned is authorized to draw.

Dated: December 6, 2005



Respectfully submitted,

By 

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